

# Notice No. 10

## Rules and Regulations for the Classification of Offshore Units, July 2014

The status of this Rule set is amended as shown and is now to be read in conjunction with this and prior Notices. Any corrigenda included in the Notice are effective immediately.

**Issue date: June 2015**

Amendments to	Effective date
Part 10, Chapter 1, Sections 1, 4, 8, 12 & 20 (New)	1 July 2015 & Corrigendum
Part 10, Chapter 2, Section 3	1 July 2015



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# Part 10, Chapter 1

## General Requirements

**Effective date 1 July 2015 and Corrigendum**

### ■ **Section 1** **General**

#### **1.3 Application of transit conditions**

*The paragraph below shows a corrigendum amendment.*

1.3.2 Disconnectable units are to be assessed for unrestricted worldwide transit, in which case the delivery voyage need not be assessed. The Owner is to define the maximum transit speed for disconnected service. For unrestricted worldwide transit, the loads defined in Chapter 2.7 are to be used. Alternatively, at the request of the Owner, the unit may be assessed to transit within a restricted service area. In this case, a service restriction will be placed on the unit and recorded in ~~the class~~ the class notation, see 1.2.5(b). The Owner is to define the wave environment for the restricted service area.

*The following amends have an effective date of 1 July 2015.*

#### **1.4 Application of acceptance criteria**

1.4.1 In general, the Working Stress Design (WSD) method is applied for the assessment of the scantlings in Chapter 3. Three sets of acceptance criteria are given that are dependent on the probability level of the characteristic combined loads.

1.4.2 The acceptance criteria set AC1 is applied when the combined characteristic loads are frequently occurring, typically for the static design load combination. This means that the loads occur on a frequent or regular basis. The allowable stress for a frequent load is lower than for an extreme load and takes into account allowance for some dynamics and operational mistakes.

1.4.3 The acceptance criteria set AC2 is typically applied when the combined characteristic loads are extreme values, e.g. typically for the static + dynamic design load combinations. High utilisation of the structural capacity is allowed in such cases because the considered loads are extreme loads with a low probability of occurrence.

1.4.4 The acceptance criteria set AC3 is typically applied for capacity formulations based on plastic collapse models such as those that are applied to address bottom slamming and bow impact loads.

### ■ **Section 4** **Structural arrangement**

#### **4.2 Arrangement for internal turrets**

4.2.1 A cofferdam or equivalent is to be arranged between cargo bulk storage tanks and the bulkheads bounding the turret well space ~~turret casing~~ or turret equipment spaces internal to the hull. The scantlings and testing requirements are to comply with Rule requirements for cofferdam bulkheads. Suitable corrosion protection, drainage and gas freeing arrangements are to be provided to such spaces. A pump-room, void space or water ballast tank will be accepted in lieu of a cofferdam.

4.2.2 The bulkheads bounding the turret well space are to comply with the scantling requirements for side shell structure and for bulkheads. Blast loading is also to be considered.

### ■ Section 8 Structural idealisation

#### 8.3 Effective bending span of local support members

8.3.1 The effective bending span,  $l_{bdg}$ , of a stiffener is defined for typical arrangements in 8.3.3 to 8.3.7. Where arrangements differ from those shown in Fig. 1.8.1 through Fig. 1.8.6, span definition may be specially considered.

8.3.2 The effective bending span may be reduced due to the presence of brackets, provided the brackets are effectively supported by the adjacent structure, otherwise the effective bending span is to be taken as the full length of the stiffener between primary member supports.

8.3.3 If the web stiffener is sniped at the end or not attached to the stiffener under consideration, the effective bending span is to be taken as the full length between primary member supports unless a backing bracket is fitted, see Fig. 1.8.2.

8.3.4 The effective bending span may only be reduced where brackets are fitted to the flange or free edge of the stiffener. Brackets fitted to the attached plating on the side opposite to that of the stiffener are not to be considered as effective in reducing the effective bending span.

8.3.5 The effective bending span,  $l_{bdg}$ , for stiffeners forming part of a double skin arrangement is to be taken as shown in Fig. 1.8.1.

8.3.6 The effective bending span,  $l_{bdg}$ , for stiffeners forming part of a single skin arrangement is to be taken as shown in Fig. 1.8.2.

8.3.7 For stiffeners supported by a bracket on one side of primary support members, the effective bending span is to be taken as the full distance between primary support members as shown in Fig. 1.8.2 (a). If brackets are fitted on both sides of the primary support member, the effective bending span is to be taken as in Fig. 1.8.2 (b), (c) and (d).

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Effective Bending Span of Stiffeners Supported by Web Stiffeners  
(Double Skin Construction)

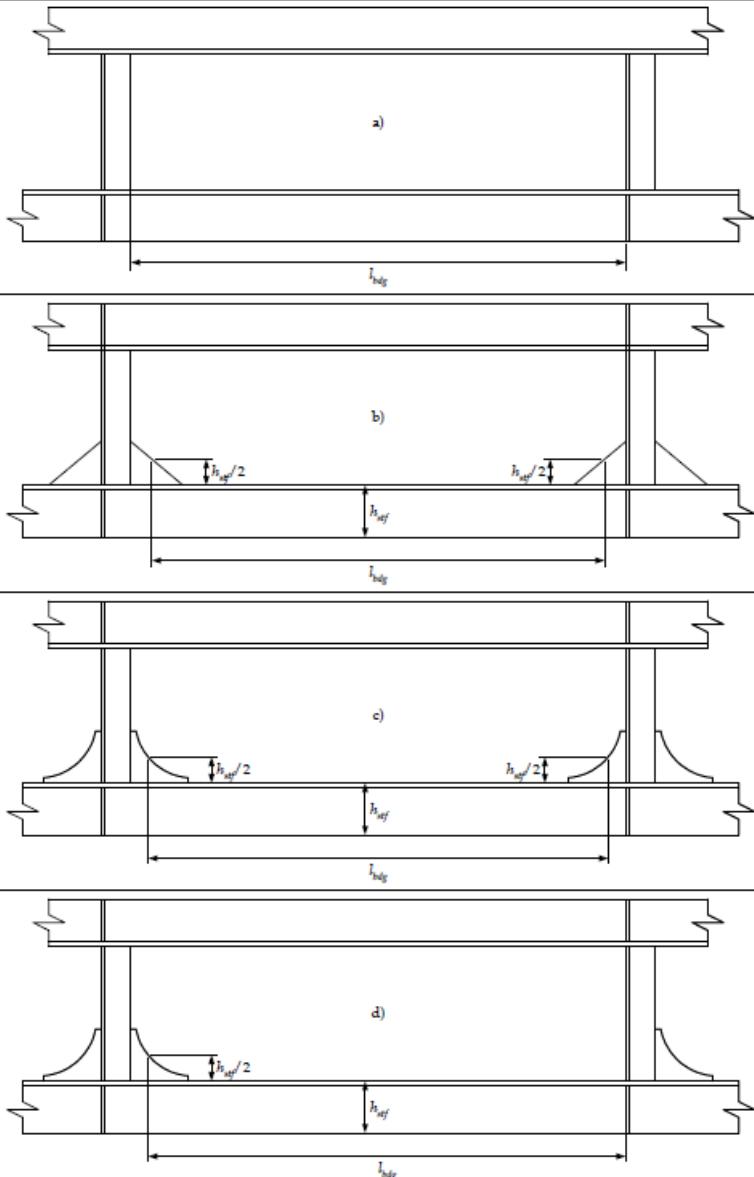


Fig. 1.8.1 – Effective Bending Span of Stiffeners Supported by Web Stiffeners  
(Double Skin Construction)

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Effective Bending Span of Stiffeners Supported by Web Stiffeners  
(Single Skin Construction)

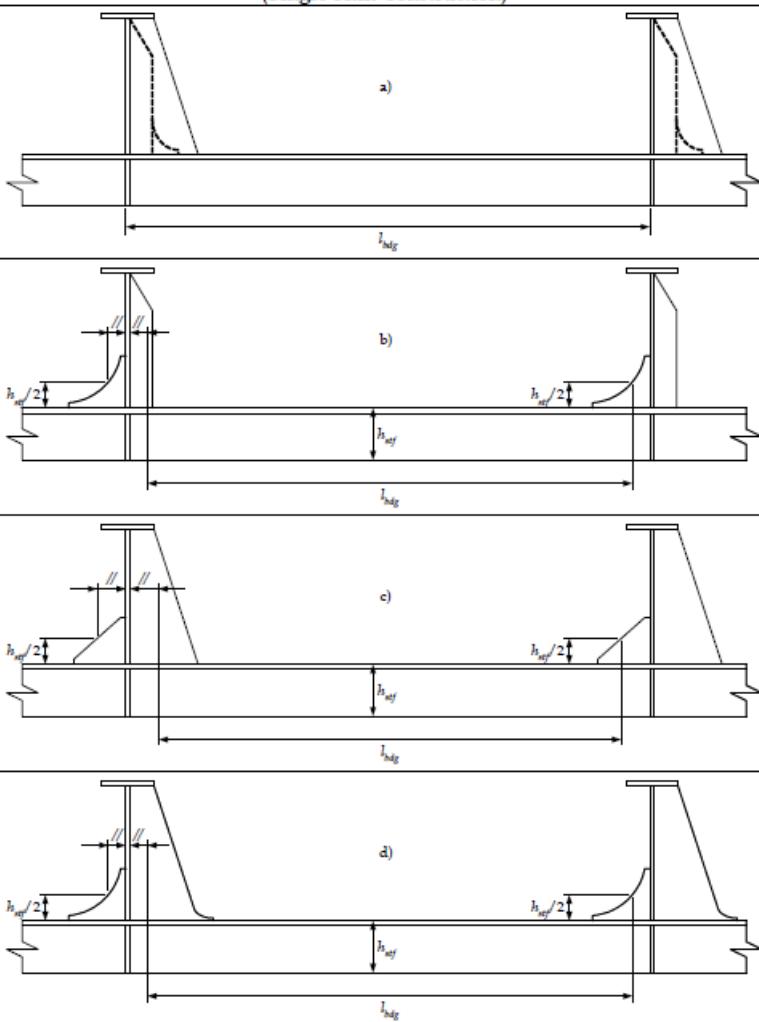


Fig. 1.8.2 – Effective Bending Span of Stiffeners Supported by Web Stiffeners  
(Single Skin Construction)

8.3.8 Where the face plate of the stiffener is continuous along the edge of the bracket, the effective bending span is to be taken to the position where the depth of the bracket is equal to one quarter of the depth of the stiffener, see Fig. 1.8.3.

Effective Bending Span for Local Support Members  
with Continuous Face Plate along Bracket Edge

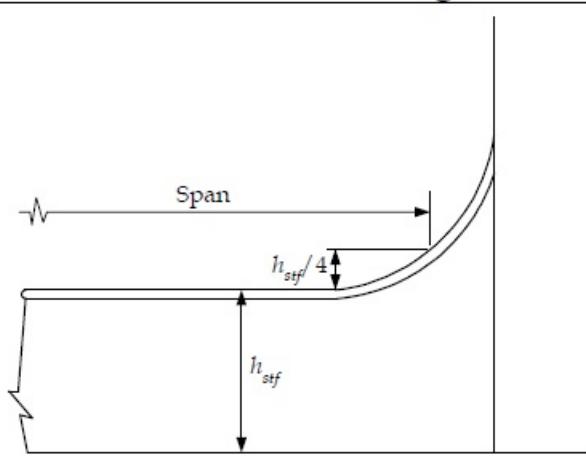


Fig. 1.8.3 – Effective Bending Span for Local Support Members with Continuous Face Plate along Bracket Edge

## Part 10, Chapter 1

8.3.9 For the calculation of the span point, the bracket length is not to be taken greater than 1,5 times the length of the arm on the bulkhead or base.

### 8.4 Effective shear span of local support members

8.4.1 The effective shear span,  $l_{shr}$ , of a stiffener is defined for typical arrangements in 8.4.5 to 8.4.7. Effective shear span for other arrangements will be specially considered.

8.4.2 The effective shear span may be reduced due to the presence of brackets provided the brackets are effectively supported by the adjacent structure, otherwise the effective shear span is to be as the full length as given in 8.4.4.

8.4.3 The effective shear span may be reduced for brackets fitted on either the flange or the free edge of the stiffener, or for brackets fitted to the attached plating on the side opposite to that of the stiffener. If brackets are fitted at both the flange or free edge of the stiffener, and to the attached plating on the side opposite to that of the stiffener the effective shear span may be calculated using the longer effective bracket arm.

8.4.4 The effective shear span may be reduced by a minimum of  $s/4000$  m at each end of the member, regardless of support detail, hence the effective shear span,  $l_{shr}$ , is not to be taken greater than:

$$l_{shr} \leq l - \frac{s}{2000} \quad \text{m}$$

Where:

$l$  full length of the stiffener between primary support members, in m  
 $s$  stiffener spacing, in mm

8.4.5 The effective shear span,  $l_{shr}$ , for stiffeners forming part of a double skin arrangement is to be taken as shown in Fig. 1.8.4.

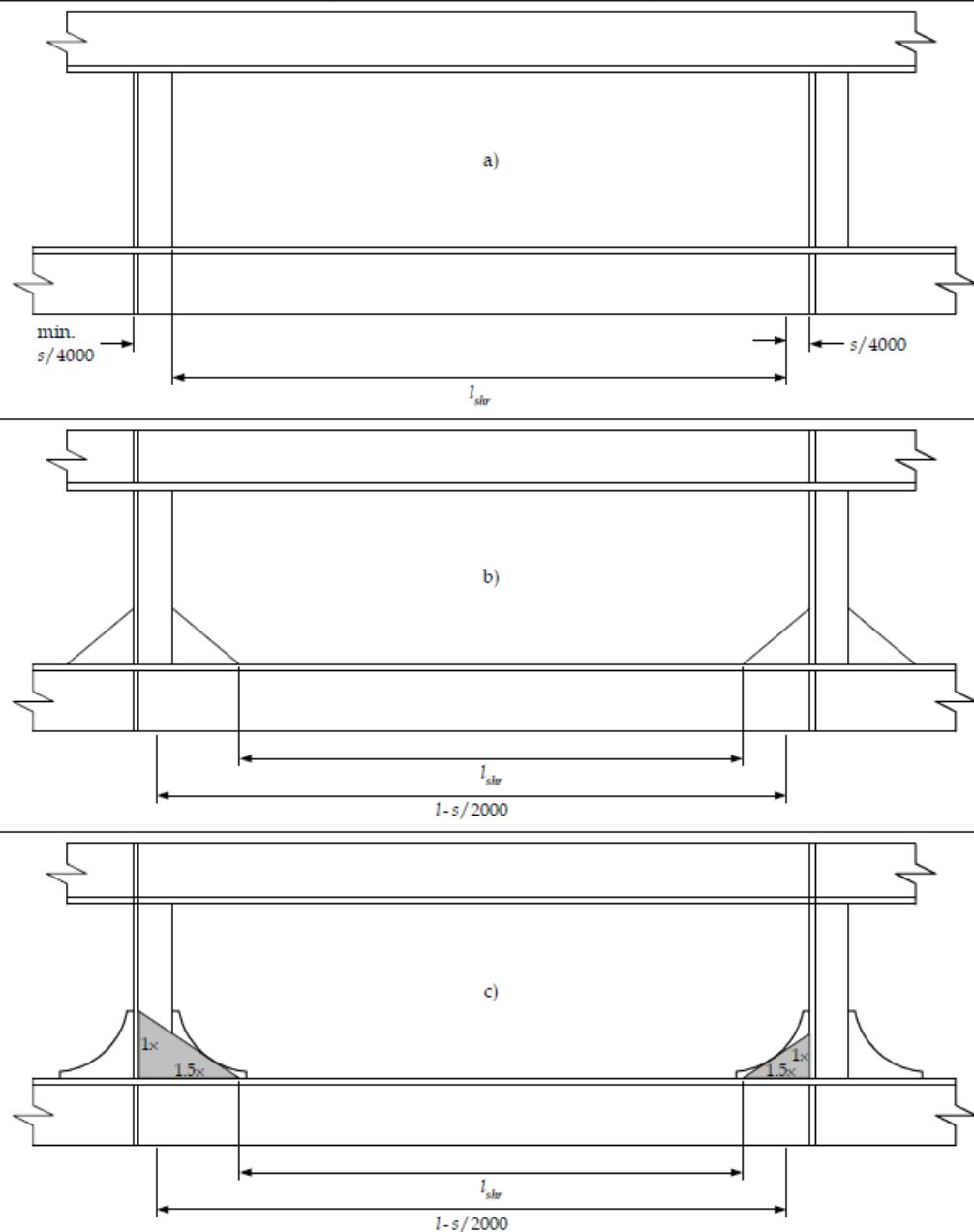
8.4.6 The effective shear span,  $l_{shr}$ , for stiffeners forming part of a single skin arrangement is to be taken as shown in Fig. 1.8.5.

8.4.7 Where the face plate of the stiffener is continuous along the curved edge of the bracket, the effective shear span is to be taken as shown in Fig. 1.8.6.

8.4.8 For curved and/or long brackets (length/height ratio) the effective bracket length is to be taken as the maximum inscribed 1:1.5 bracket as shown in Fig. 1.8.4 (c) and Fig. 1.8.5 (c).

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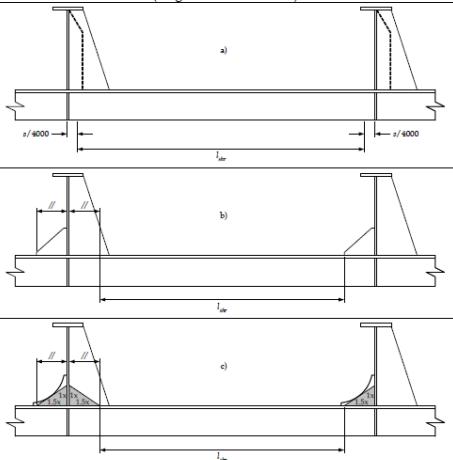
### Effective Shear Span of Stiffeners Supported by Web Stiffeners (Double Skin Construction)



**Fig. 1.8.4 – Effective Shear Span of Stiffeners Supported by Web Stiffeners  
(Double Skin Construction)**

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Figure 4.2.5  
Effective Shear Span of Stiffeners Supported by Web Stiffeners  
(Single Skin Construction)



Effective Shear Span of Stiffeners Supported by Web Stiffeners  
(Single Skin Construction)

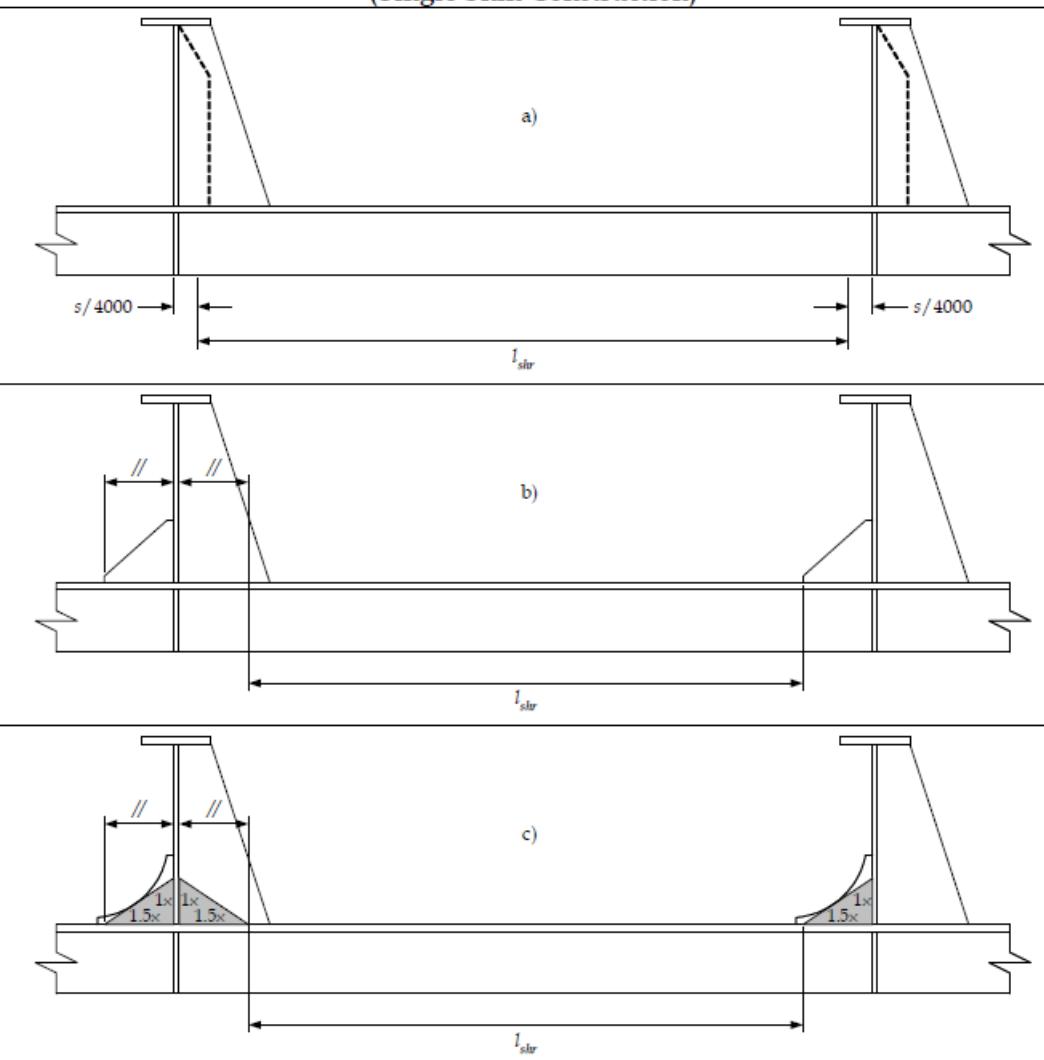


Fig. 1.8.5 – Effective Shear Span of Stiffeners Supported by Web Stiffeners  
(Single Skin Construction)

**Effective Shear Span for Local Support Members with Continuous Face Plate along Bracket Edge**

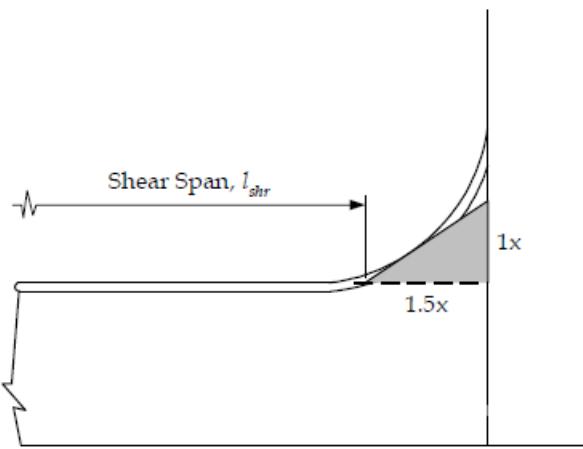


Fig. 1.8.6 – Effective Shear Span for Local Support Members with Continuous Face Plate along Bracket Edge

■ **Section 12**  
**Corrosion additions**

**12.1 General**

**Table 1.12.1 Corrosion rate for one side of structural member**

Compartment type	Structural member	Corrosion rate $t_{c1}, t_{c2}$ (mm/year)
Ballast water tank	Within 3m below top of tank, see Note 1 Elsewhere	0,15 0,1
Cargo oil tank	Within 3m below top of tank, see Note 1 Bottom of single bottom tanks Elsewhere	0,125 0,125 0,075
Exposed to atmosphere	Weather deck plating Other members	0,1 0,075
Exposed to sea water	Shell plating	0,075
Fuel and lubricating oil tank see Note 3		0,05
Fresh water tank		0,05
Slop tanks		0,15
Void spaces, see Note 2	Spaces not normally accessed, e.g., access only via bolted manhole openings, pipe tunnels, inner surface of stool space common with a dry bulk cargo hold, etc. Chocks and supports for independent tanks located in a void space	0,05
Dry spaces	Internals of machinery spaces, pump-room, store rooms, steering gear space, etc.	0,05
Hold space bounding membrane liquefied gas tanks	Side of hull structure within hold space where there is environmental control such as inerting.	0

**NOTES**

1. This is only applicable to cargo tanks and ballast tanks with weather deck as the tank top.
2. The corrosion rate on the outer shell plating in way of a pipe tunnel is to be taken as for a water ballast tank.
3. 0,07 mm/year is to be added to the plate surface exposed to ballast for the plate boundary between water ballast and heated cargo oil tanks. 0,03 mm/year is to be added to each surface of the web and face plate of a stiffener in a ballast tank and attached to the boundary between water ballast and heated cargo oil tanks. Heated cargo oil tanks are defined as tanks arranged with any form of heating capability.

### ■ Section 20 Stiffness and Proportions

#### 20.1 Structural Elements

##### 20.1.1 General

20.1.1.1 All structural elements are to comply with the applicable slenderness or proportional ratio requirements in 20.2.

#### 20.2 Plates and Local Support Members

##### 20.2.1 Proportions of plate panels and local support members

20.2.1.1 The net thickness of plate panels and stiffeners is to satisfy the following criteria:

(a) plate panels

$$t_{net} \geq \frac{s}{C} \sqrt{\frac{\sigma_{yd}}{235}}$$

(b) stiffener web plate

$$t_{w-net} \geq \frac{d_w}{C_w} \sqrt{\frac{\sigma_{yd}}{235}}$$

(c) flange/face plate

$$t_{f-net} \geq \frac{b_{f-out}}{C_f} \sqrt{\frac{\sigma_{yd}}{235}}$$

Where:

$s$  plate breadth, in mm, taken as the spacing between the stiffeners

$t_{net}$  net thickness of plate, in mm

$d_w$  gross depth of stiffener web, in mm, as given in Table 1.20.1

$t_{w-net}$  net web thickness, in mm

$b_{f-out}$  gross breadth of flange outstands, in mm, as given in Table 1.20.1

$t_{f-net}$  net flange thickness, in mm

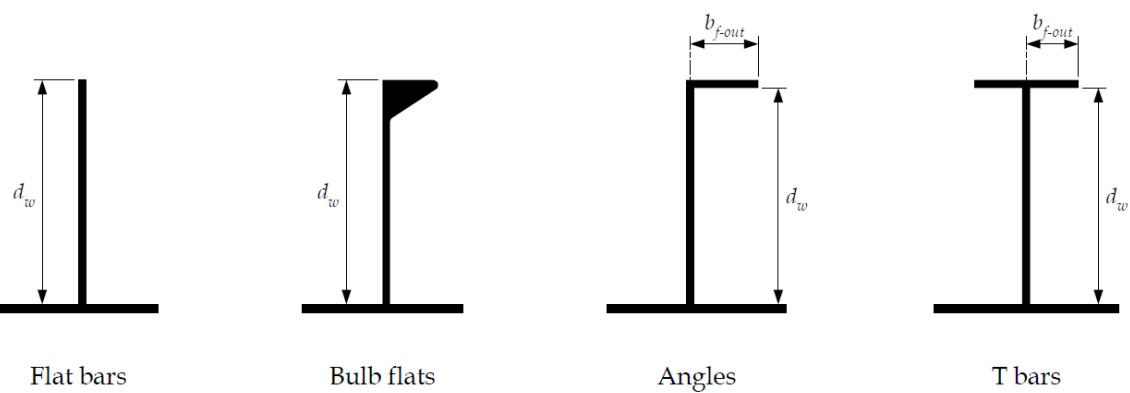
$C, C_w, C_f$  slenderness coefficients, as given in Table 1.20.1

$\sigma_{yd}$  specified minimum yield stress of the material, in N/mm<sup>2</sup>

**Table 1.20.1 Slenderness Coefficients**

Item		Coefficient
Plate panel, $C$	Hull envelope and tank boundaries	100
	Other structure	125
Stiffener web plate, $C_w$	Angle and T profiles	75
	Bulb profiles	41
	Flat bars	22
Flange/face plate, $C_f$ see Note 1	Angle and T profiles	12
Note		
1. The total flange breadth, $b_f$ , for angle and T profiles is not to be less than: $b_f = 0,25d_w$		
Where:		
$t_{net}$	net thickness of plate, in mm	
$d_w$	gross depth of web plate, in mm	
$t_{w-net}$	net web thickness, in mm	
$b_{f-out}$	gross breadth of flange outstands, in mm	
$t_{f-net}$	net flange thickness, in mm	

## Part 10, Chapter 1



## Part 10, Chapter 2

### Loads and Load Combinations

Effective date 1 July 2015

#### ■ **Section 3** **Dynamic load components**

##### 3.4 Return periods and probability factor, $f_{prob}$

**Table 2.3.3** Return periods for scantling requirements and strength assessment

Operational condition	Transit			Normal on-site operation	Inspection/maintenance	Accidental
	Delivery voyage	Restricted Service area	Unrestricted World-wide			
Return period	1 year with all all year data or 10 year with Seasonal data	25 years	25 years	100 years	100 years with all year data or 100 years with seasonal data where consistent with the operation of the unit see also 3.4.5 and Note 1	1 year
Environment	World-wide or Owner-defined Transit route	Restricted service area	World-wide	Site-specific	Site-specific	Site-specific
NOTE						
1. Alternative return periods will be specially considered based on the duration of the inspection/maintenance period and the site specific environment.						

## **Cross-References**

Section numbering in brackets reflects any Section renumbering necessitated by any of the Notices that update the current version of the Rules for Offshore Units.

### **Part 10, Chapter 1**

8.3.1 *now* 8.5.1 Reference to Part 10, Chapter 1, 8.3.3 *now* reads Part 10, Chapter 1, 8.5.3

8.4.2 *now* 8.6.2 Reference to Part 10, Chapter 1, 8.4.1 *now* reads Part 10, Chapter 1, 8.6.1

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